Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_

**Relative Humidity and Dew Point Demo**

***Relative Humidity****:* How much water vapor or moisture is in the air compared to the amount it can hold.

Materials Needed: 2 Celsius thermometers – one dry and one “wet”, Water



Procedure:

1. Thoroughly wet the cotton on the thermometer by dipping it into the beaker of water.
2. You have created a **psychrometer** (a wet and dry bulb thermometer that measures relative humidity).
3. Create air motion across both thermometer bulbs by quickly fanning them with a sheet of paper.
4. What until the alcohol thermometer stops moving and **record the temperature**.
5. **Subtract the wet bulb temperature** from the **dry bulb temperature.**
6. Use the table to determine the relative humidity. This is done by locating the dry bulb reading and difference along the top and the bottom of the chart. Move your fingers so that you find where they intersect. This is the percent **relative humidity.**
7. **Record the relative humidity** in the table below.
8. Repeat steps 3 – 6 inside the classroom, outside the school and at your specified location. Be sure to soak the wet bulb thermometer again at each new test site. Wait at least two minutes between trials in order to let the thermometers adjust to the new location.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Classroom** | **Outside** |  |
| **Dry-Bulb Reading** |  |  |  |
| **Wet-Bulb reading** |  |  |  |
| **Difference** |  |  |  |
| **Relative Humidity** |  |  |  |

Analysis

1. In general, how did the wet bulb temperature compare at each location to the dry bulb temperature?
2. Which location had the highest humidity? What unique observations did you notice about the location with the highest humidity?
3. Which location had the lowest humidity? What unique observations did you notice about the location with the lowest humidity?
4. After using the relative humidity table to complete the data sheet, predict the relative humidity if the wet bulb and the dry bulb thermometers recorded the same temperature.
5. How can you tell, without using a psychrometer, whether the air is moist or dry?
6. When will you feel hotter, at 95° in dry air or in 95° before a thunderstorm? Explain.
7. Would you feel colder wearing a wet shirt in 30% humidity or in a wet shirt in 60% humidity? Explain.

***Dew Point****:* the temperature at which the water vapor in the air becomes saturated and condensation begins.

![MCj04418500000[1]]()In this activity, you will be measuring dew point. You will then try to make a connection between the relative humidity of the room and the dew point. Read through each step of the procedure.

**Procedures:**

1. Find the starting temperature of your location. \_\_\_\_\_
2. Fill approximately 1/3 of the metal can with room temperature water.
3. Very slowly add ice and stir.
4. Observe the outside of the metal can while the ice is melting.

When a thin film forms on the outside of your can record the temperature of the water. This is your dew point.

* 1. \*Note – this will not be obvious. You will have to make careful observations. Swipe your finger across the can to see if it leaves a streak
1. Empty the can and dry off the outside.
2. Repeat three more times to obtain an average temperature.

|  |  |  |
| --- | --- | --- |
| **Trial Number** | **Dew Point (°C)** | **Dew Point (°C)** |
| Trial 1 |  |  |
| Trial 2 |  |  |
| Trial 3 |  |  |
| Trial 4 |  |  |
| Average Dew Point |  |  |

**Data:**

1. Why was a metal can used in this experiment instead of some other substance (like plastic or glass)?

2. Explain what is causing the water to condense on the outside of the can?

3. What is the source of the condensed water?